

ONGOING PROCEDURES IN TEACHING MATHEMATICS AT THE ELEMENTARY LEVEL IN THE DARJEELING DISTRICT OF WEST BENGAL

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ABSTRACT

This study aimed at examining the ongoing procedures in teaching mathematics at the elementary level. It is important to investigate and identify the procedures followed by the mathematics teachers during teaching. Objectives: To find out the manner of preparation undertaken by the Mathematics teachers; to ascertain the teaching procedure of Mathematics teachers; and to explore the problems faced by teachers in teaching Mathematics. Sample consisted of 105 numbers of teachers from primary and upper primary schools of Darjeeling district. Data was collected using a Questionnaire. Findings: Elementary teachers selected comprise from both Lower and Upper Primary levels. 79% of the teachers mostly use Lesson Plan in class. The manner of preparation undertaken for teaching reveals that 43.8% is carried out from textbooks. Preference of TLM during classroom transaction is preferred by the majority 50.5% of the teachers. Mode of transaction in Class carried out by 52.4% of the teachers is through textbook & teaching aids. The manner of illustration of examples for each lesson is illustrated by 45.7% of teachers through examples cited in the textbook. With respect to Teaching method adapted by the teachers varies according to the choice out of 6 varieties of methods. With respect to the better performance by the students in mathematics, it is mainly because of students' natural ability; good teaching; support from parents/guardians as opined by all the teachers. Certain factors are responsible for better performance by the students in mathematics.

KEYWORDS: Teaching Mathematics; Elementary Level & Darjeeling District

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INTRODUCTION

The Department of School Education deal with a variety of educational challenges, implementation of NEP, 2020 is of prime one followed by equity, excellence and employability at the primary, secondary and higher secondary level. Universal access, reduction in dropout rates, increase in retention rate, optimal presence of infrastructure (both human and physical) and enhancement of quality come within the purview of the department. To cite, Utkarsha Abhijan is an initiative where the students of primary schools are assessed to get an idea of their learning levels. Through this program, it intends to generate awareness regarding the quality of education amongst teachers, guardians, government officials at different levels and the community at large.

Mathematics is the means of sharpening the individual's mind, shaping his reasoning ability and developing his personality, hence, its immense contribution to the general and basic education of the people of the world (Asiedu-Addo and Yidana, 2000). Mathematics encourages the practice of self-reliance and helps students think about their problems and solve them (Adedayo; 1997). Teachers' beliefs play an important role in mathematics that has a powerful impact on teaching practice (Charalambos, Philippou & Kyriakides, 2002; Ernest, 2000). Mathematics-anxiety is not a separate condition but it is- "construct with multiple causes and multiple

effects interacting in a tangle that defies simple diagnosis and simplistic remedies” (Martinez & Martinez, 1996, p.2; Bessant, 1995). Phobia in mathematics is learned as a psychological response, and it often causes intense anxiety (Tillfors, 2003).

Jyotsna Jalan (2010), studied the quality of primary education in West Bengal, confirms that learning levels and attendance rates in primary schools remain low in rural West Bengal. Regarding student’s performance in reading and arithmetic, the study shows a direct relationship between language and numeracy test scores i.e., if a child has performed well in one subject she is also likely to have performed well in the other subject.

Mukhopadhyay & Chatterjee (2014) West Bengal has participated in the nation-wide goal of universalisation of elementary education. This paper investigates how far the promise has been kept from the quality perspective. An overview of elementary education in rural West Bengal is provided in this context. This exercise is based on cross-district secondary data from the ASER on the ability to read (vernacular) and simple calculation. Simple statistical tools have been used for data analysis. The exercise identifies the high and low performing districts and studies their performance over the years. The trend analysis unveils retrogression of the quality parameter over the years. Policies have all along been stressed on steady expansion in enrollment without paying much attention to the learning outcome. Quality has thus been compromised in the process.

The Pedagogical Approaches in Mathematics Education explores the responsibility of Mathematics Teachers & finds out the problems and challenges to integration Mathematics and Pedagogical knowledge & it reduces the problems and challenges to integration Mathematics and Pedagogical knowledge (Das, 2019).

Statement of the Problem

This study aimed at examining the ongoing procedures in teaching mathematics at the elementary level. It is important to investigate and identify the procedures followed by the mathematics teachers during teaching. The environment and teaching methods suitable for mathematics education are of particular importance.

Objectives

- To find out the manner of preparation undertaken by the Mathematics teachers
- To ascertain the teaching procedure of Mathematics teachers
- To explore the problems faced by teachers in teaching Mathematics.

Population

The target population is all the teachers of Govt., Govt.- sponsored, Govt. Aided schools and those run by Local Body having Primary and Upper Primary sections in Darjeeling district of West Bengal.

Sample size: 105 numbers of teachers from primary and upper primary schools of Darjeeling district.

Tool: Questionnaire consisted of 24 items.

Analysis and Interpretation

General Information of teacher respondents

General information about teachers is presented in Table 3.

Table 1: Information Regarding Respondents (Darjeeling District)

Particulars	Options	Number of Respondents	%
Type	Lower Primary	49	46.7
	Upper Primary	56	53.3
Gender	Male	74	70.5
	Female	31	29.5
Qualification of Teachers	BA, DELED	12	11.43
	BA, BEd	18	17.14
	BSc, DELED	11	10.47
	BSc, BEd	6	5.71
	MA, DELED	9	8.57
	MA BEd	17	16.19
	MSc, DELED	5	4.76
	MSC, BEd	25	23.81
	MSc, BEd, PHD	2	1.90
Experience in years	2-5	31	29.52
	6-9	29	27.62
	10-13	29	27.62
	14-17	5	4.76
	18-21	11	10.47
Subject taught	Beng, Eng, Math	33	31.4
	Eng, Math	11	10.5
	Eng, Beng	10	9.5
	Eng, Sc, Math	13	12.4
	Life Science	7	6.7
	Maths, Hist	12	11.4
	Phy.Sc.	14	13.3
	Sc, Math	5	4.8
Number of Teachers	2	18	17.1
	3	32	30.5
	4	55	52.4

46.7% of the teachers are from Lower Primary and the rest 53.3% are from Upper Primary level.

70.5% of teacher respondents found to be male members and 29.5% are female respondents. Educational qualification of the teacher respondents varies BA, DELED (11.43%); BA BEd(17.14%); BSc,BED (5.71%); MA, DELED (8.57%); MA,BED (16.19); MSC,DELED

(4.76%); MSC, BEd (23.81%); MSC, BEd, PHD (1.9%). The experience of teachers varies from 2- 21 years: 2-5years (29.52%); 6-9 years (27.62%); 10-13 years (27.62%); 14-17 years (4.76%);18-21 years (10.47%). Different school subjects are taught by the teachers such as Bengali, English, Mathematics (31.4%); English, Mathematics (10.5%); Bengali, English (9.5%); English, Science, Mathematics (12.4%); Life Science (6.7%); Mathematics, History (11.4%); Physical Science (13.3%); and Science, Mathematics (4.8%). Number of teachers varies from 2- 4 (2 – 17.1%; 3 – 30.5; 4 52.4%) depending on the schools.

Preparation Undertaken by the Mathematics Teachers

Only 47.6% of the teachers are found to like teaching at the elementary level and the rest 52.4% like it very little extent. Activities preferred in the classroom teaching process by the teacher indicates that 9.5% like it to great extent; 58.1% like it to some extent and 32.4% like it to a very little extent. It is observed that 3.8% of the teachers are always well prepared

while going to class; 5.7% mostly; 9.5% sometimes; and 81% rarely.

Table 2: Liking Aspects in Teaching Process

Aspects	Options	Number of Respondents	%
Extent of liking	Very great extent		
	Great extent	18	17.1
	Some extent	32	30.5
	Very little extent	55	52.4
Activities preferred in the classroom	Very great extent	6	5.7
	Great extent	4	3.8
	Some extent	61	58.1
	Very little extent	34	32.4
Well prepared while going to class	Always	4	3.8
	Mostly	6	5.7
	Sometimes	10	9.5
	Rarely	85	81.0

29.5% of the teachers mostly use Lesson Plan in class; 49.5% uses sometimes; and 21% rarely uses it. The manner of preparation undertaken for teaching reveals that 43.8% is carried out from textbooks; 23.8% from textbook and search material from computer; and 32.4% from textbook and search material from mobile. Preference of TLM during classroom transaction is always preferred by 10.5%; mostly by 40%; sometimes by 27.6% and rarely by 21.9%. Preparation of examples for every lesson is carried out by 6.7% as given in the textbook; 84.8% as given in the textbook and from reference; 8.6% as given in the textbook and online sources.

Table 3: Use of Lesson Plan and TLM in Classroom Teaching

Aspects	Options	Number of Respondents	%
Use Lesson Plan in class	Always	0	
	Mostly	31	29.5
	Sometimes	52	49.5
	Rarely	22	21.0
Manner of preparation undertaken for teaching	From textbook	46	43.8
	From textbook and search material from computer	25	23.8
	From textbook and search material from mobile	34	32.4
Manner of preparation of Lesson Plan	Manually from textbook	78	74.3
	In Microsoft Word/ PowerPoint	24	22.9
	Online source	3	2.9
Preference of TLM during classroom transaction	Always	11	10.5
	Mostly	42	40.0
	Sometimes	29	27.6
	Rarely	23	21.9
Preparation of examples for every lessons	As given in the text book	7	6.7
	As given in the text book and from reference	89	84.8
	Textbook and online sources	9	8.6
	Online sources only	0	

Procedure of Teaching Mathematics by Teachers

Further, an analysis of the aspects of teaching process is presented in table 6. With regard to the mode of transaction in Class, it is observed that 52.4% of the teachers utilize textbook & teaching aids; 37.1% uses a textbook and 10.5% applies

textbook and interactive board. In the manner of illustration of examples for each lesson, it is found that 45.7% illustrates examples cited in the textbook; and 43.8% shows examples referred in reference materials. With respect to the Teaching method it is observed that Deductive Method is preferred by 10.5%; Inductive Method by 27.6%; Heuristic method by 3.8%; Analytic Method by 24.8%; Project Method by 10.5%; and Visual Method by 6.7%. According to the teachers, nowadays teaching procedure must be as the teacher thinks to be the right way is as per the demand of the textbook lessons opted by 21%; as per the need of the students by 43.8%; as the teacher thinks to be the right way 24.8%; as given in the textbook and from reference 10.5%.

Table 4: Method of Classroom Transaction

Aspects	Options	Number of Respondents	%
Mode of transaction inClass	Using textbook	39	37.1
	Textbook & teaching aids	55	52.4
	Textbook and Projector	0	
	Textbook and Interactive Board	11	10.5
Manner of illustration of examples for each lessons	Examples cited in Textbook	48	45.7
	Examples are referred fromreference materials	46	43.8
	Examples are cited using computer	0	
	Examples cited through onlinemobile	11	10.5
Teaching methodpreferred	Deductive Method	29	27.6
	Inductive Method	28	26.7
	Heuristic method	4	3.8
	Analytic Method	26	24.8
	Project Method	11	10.5
	Visual Method	7	6.7
Nowadays teachingprocedure must be	As per the demand of the textbooklessons	22	21.0
	As per the need of the students	46	43.8
	As the teacher thinks to be the rightway	26	24.8
	Technology oriented	0	
	As given in the text book	0	
	As given in the text book and fromreference	11	10.5
	Textbook and online sources	0	
	online sources only	0	

76.2% of the teachers make use of teaching aids for every lesson in the classroom. The type of materials used as teaching aid varies depending on the need of the lesson (majority 23.8% of teachers makes use of chart). 62.9% makes use of a single type of teaching aid and the rest makes use of a mixture of 2 or 3 types of teaching aids.

Table 5: Teaching Aids in use

Aspects	Options	Number of Respondents	%
Make use of teachingaids in the classroom	For every lesson	80	76.2
	For certain lesson	25	23.8
	Do not use	0	
Type of materials usedas teaching aid	Chart	25	23.8
	Poster	7	6.7
	Model	4	3.8
	Card	11	10.5
	Real objects	19	18.1
	Toys	0	
	Plastic materials	11	10.5

Chart + Model	7	6.7
Chart + Model + Card	11	10.5
Chart + Card + Toys	7	6.7
Chart + Real objects	3	2.9

It is observed that before starting the lesson, motivating the students is very essential for 23.8% of the teacher respondents; essential for 6.7%; somewhat essential for 23.8% and not required expressed by 45.7%. According to 42.9% of the respondents, students understand the concepts by explaining the meaning; 53.3% does it by citing examples and 3.8% use the help of teaching aids. Teachers offer scope for interaction in Mathematics class by the students any time during explanation as per 96.2% and the same is done only after the end of explanation by 3.8%. Attend to each and every student of the class during teaching and learning process by focusing attention mainly on the left side of the classroom as per 3.8%; and 96.2% does it by focusing attention mainly on all the students of the classroom.

Table 6: Pattern of Teaching Process

Aspects of Teaching	Options	Number of Respondents	%
Before starting the lesson motivating the students necessary	Very essential	25	23.8
	Essential	7	6.7
	Somewhat essential	25	23.8
	Not required	48	45.7
Make the students understand the concepts	make aware of meaning	45	42.9
	cite examples	56	53.3
	use teaching aids	4	3.8
Scope for interaction in Mathematics class by the students	Yes, any time during explanation	101	96.2
	Yes, only after the end of explanation	4	3.8
	Not necessary	0	
Attend to each and every student of the class during teaching learning Process	Focus attention on the middle of the classroom	0	
	Focus attention mainly on the right side of the classroom	0	
	Focus attention mainly on the left side of the classroom	4	3.8
	Focus attention mainly on all the students of the classroom	101	96.2

Extent of praise/reward offered to the students in the classroom it is seen that 46.6% do it always for everyone; 21% do it only to the deserving one; and 32.4% feel it not necessary. All the teacher respondents are found to be satisfied with the Mathematics syllabus offered in the school. As per the rating of Mathematics syllabus at the elementary level done, it is found that 17.1% did it very high; 54.3% did high; and 28.6% rated average. It is found that 45.7% of the respondents are satisfied with the abilities of students in learning Mathematics but 54.3% are not.

Table 7: Satisfaction Derived by Mathematics Teachers

Aspects of teaching	Options	Number of Respondents	%
Rating of Mathematics syllabus at the elementary level	Very High	18	17.1
	High	57	54.3
	Average	30	28.6
	Low	0	
	Very Low	0	
Satisfied with the Mathematics syllabus	Yes	105	100.0

offered in the school	No	0	
Extent of praise/reward offered to the students in the classroom	Always for everyone	49	46.6
	Only to the deserving one	22	21.0
	Not necessary	34	32.4
Satisfied with the abilities of students in learning Mathematics	Yes	48	45.7
	No	57	54.3

With regard to the better performance by the students in mathematics, it is mainly because of students' natural ability; good teaching; support from parents/guardians as opined by all the teachers. According to 62.86% of the teachers better performance in mathematics is due to their good habits; 88.57% expressed because of positive peer influence; 84.76% it's due to student effort/motivation; and 63.81% opined due to mathematics skills were well learned in earlier grades.

With respect to the better performance by the students in mathematics, it is mainly because of students' natural ability; good teaching; support from parents/guardians opined by all the teachers and this is evident from variance figures (depicted in Table 10).

Table 8: Factors Responsible for Performance in Mathematics

Students do well in Mathematics Classes, it is because of	Average	Variance
(a) natural ability	3	0
(b) good work habits	3.37	0.23
(c) good teaching	3	0
(d) support from parents/guardians	3	0
(e) positive peer influence	3.11	0.10
(f) student effort/motivation.	3.15	0.13
(g) mathematics skills were well learned in earlier grades	3.36	0.23

Further, the factors are subjected to ANOVA reveals that the calculated value of 28.35 is greater than the tabulated value of 1.04 at 0.01 level of confidence. Thus, it follows that these factors are responsible for better performance by the students in mathematics.

Table 9: ANOVA

Source of Variation	SS	df	MS	F
Between Groups	17.04762	6	2.84127	28.35335
Within Groups	72.95238	728	0.100209	
Total	90	734		

Problems Faced by Teachers in Teaching Mathematics

A variety of problems are found to face by teachers in teaching Mathematics in the areas such as Mathematics syllabus, content in books, infrastructural facilities (27.63%); lack of proper teaching environment, study materials (1.9%); lack of attention, interest, defective handwritings, carelessness (38.09%); lack of practice at home (13.33%); and family background of the students, quality teaching, students lack basic idea (19.05%).

Table 10: Problems Faced by Teachers in Teaching Mathematics

Problems Faced	Number of Respondents	%
Syllabus in Mathematics, content in books needs better explanation and better infrastructure in schools	29	27.63
Lack of - proper teaching environment, enthusiastic students, mathematics study materials, mathematics teachers for certain classes	2	1.9
Lack of attention, interest, defective handwritings, carelessness	40	38.09
Lack of practice at home, negligence in homework	14	13.33
Lacks basic idea, unmindful, neglects quality teaching, most of the students are from poor background family,	20	19.05

FINDINGS

Elementary teachers selected comprise from both Lower and Upper Primary levels. All the elementary teachers happen to be trained with varying degrees, degree holders are 44.75%, post graduate holders being 53.33% and doctorate holders is 1.9%. The experience of teachers varies from 2- 21 years. A variety of school subjects are taught by the teachers.

Majority (79%) of the teachers mostly use Lesson Plan in class. The manner of preparation undertaken for teaching reveals that 43.8% is carried out from textbooks. Preference of TLM during classroom transaction is preferred by majority 50.5% of the teachers. Preparation of examples for every lesson is carried out by 84.8% as given in the textbook and from reference.

Mode of transaction in Class carried out by 52.4% of the teachers is through textbook & teaching aids. The manner of illustration of examples for each lesson is illustrated by 45.7% of teachers through examples cited in the textbook. With respect to Teaching method adapted by the teachers varies according to the choice out of 6 varieties of methods. According to a majority (43.8%) of the teachers, nowadays teaching procedure must be as per the need of the students opined by 43.8% 76.2% of the teachers make use of teaching aids for every lesson in the classroom. 62.9% makes use of single type of teaching aid.

According to 54.3% of the teachers before starting a lesson, motivating the students is essential but 45.7% says not required. 96.2% of the teachers offer scope for interaction in Mathematics class by the students any time during the explanation. 96.2% does it by focusing attention mainly on all the students of the classroom.

46.6% always offer praise/reward to the students in the classroom but 32.4% feels is not necessary. 96.2% does it by focusing attention mainly on all the students of the classroom. All the teacher respondents are found to be satisfied with the Mathematics syllabus offered in the school. 71.4% rated high for Mathematics syllabus at the elementary level. Only 45.7% of the respondents are satisfied with the abilities of students in learning Mathematics but 54.3% are not.

With respect to the better performance by the students in mathematics, it is mainly because of students' natural ability; good teaching; support from parents/guardians as opined by all the teachers. Certain factors are responsible for better performance by the students in mathematics.

A variety of problems are found to face by teachers in teaching Mathematics in the areas such as Mathematics syllabus, content in books, infrastructural facilities; lack of proper teaching environment, study materials; lack of attention, interest, defective handwritings, carelessness; lack of practice at home; and family background of the students, quality teaching, students lack basic idea.

Charalambos, Philippou & Kyriakides, 2002; Ernest, 2000 Jalan (2010) observed that the performance level of students in mathematics is low which conforms with the opinion of teachers in the present study. Mukhopadhyay & Chatterjee (2014) highlighted the compromise with the quality of teaching and this is evident from the present study that quality in mathematics needs to be raised. Das, (2019) pointed out regarding problems and challenges which is also revealed from this study which has to be dealt with priority for an adequate solution concerning the issues.

CONCLUSIONS

The present study portrays the opinion of elementary school teachers in the Darjeeling district of West Bengal on the ongoing teaching practices. There is a need to improve the condition of the classrooms, supply of teaching learning material, recruitment of teachers to enhance the quality of teaching practices thereby promoting quality teaching at the elementary level.

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